

FIFTEEN MINUTES OF RADIO EACH DAY

By Edward N. Davis

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Lesson No. 168.

THE RESONANCE CURVE AND ITS USES.

A resonance curve is a graphical means of showing the changes in the current flowing in a circuit when changes are made in the circuit which affect the condition of resonance. For example, a resonance curve is useful in determining the decrement of the emitted wave from a spark transmitter or in ascertaining if there is more than one energy maximum or "hump" in the emitted wave.

The resonance curve is generally plotted in current units against wavelength. Figure (1) shows a typical resonance curve of a spark transmitter when the circuit is emitting a single wave length, while Figure (2) represents the conditions in a spark transmitter which is emitting two sharp defined wave lengths. Curves shown in Figure (1) and (2) may both be made from readings taken from a wave meter such as shown in Figure (3) placed in inductive relation to the antenna. The wave meter consists of a fixed inductance and a variable condenser with a thermometer in series. The wave length corresponding to any particular setting of the condenser may be taken from a chart which accompanies the wave meter or the meter may be calibrated directly in meters wave-length.

In order to obtain the condition of resonance shown in Figure (1) loose coupling must be employed between the open and closed circuits of the spark transmitter and the closed circuit must contain a gap having good quenching qualities. Figure (2) illustrates the condition usually found in amateur stations employing non-synchronous gaps with very tight coupling between the primary and secondary circuits. When the coupling is reduced gradually the two peaks in the resonance curve come closer together, indicating that there is less reaction between the two circuits and the radiated energy is more nearly concentrated on a single wave length.

It is possible to calculate the decrement of the emitted wave of the spark transmitter, for which the resonance curve has been drawn but the decrement of the wave meter must be known and must be subtracted from the calculated decrement which includes the decrement of both the wave meter and the circuit under measurement. Continuous wave transmitters having no decrement, the calculated decrement would be that of the instrument alone if a resonance curve were made for such transmitter. This method is employed for determining the decrement of the wave meter circuit itself.

The resonance curve may also be used to ascertain if the wave emitted by a spark transmitter complies with the governmental regulation which states that the energy in none of the lesser waves emitted shall exceed ten per cent. of the energy in the wave of greatest amplitude. Whether or not the emitted wave complies with this requirement may be determined by comparison between the amplitudes of the peaks of the resonance curve in terms of the current units employed in drawing the curve.

If some form of sensitive indicating meter is employed it is possible to gather data for a resonance curve of a spark transmitter at a distant receiving station. Such an instrument would be a valuable asset for operators interested in checking the amount of interference caused by various transmitting stations.

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Lesson No. 164.

"WIRED WIRELESS"

Various names have been given to a system of radio communication, which employs wire circuits used for power transmission or wire telephony to conduct the waves to the receiving station. Some of the names used for this form of communication are, "guided wave telephony," "line radio telephony," and "wired wireless."

Line radio telephony can very easily be established by coupling radio transmitters and receivers to each end of a pair of wires instead of to antenna systems. The range over which communication may be carried on may be greatly increased by using wires to guide the energy to the receiving station in this manner, sometimes as much as twenty times.

It has been demonstrated that the wires used for guiding the radio frequency waves may be those regularly employed for conduct-current for other purposes, and it is not necessary to stop the flow of other currents in the conductors in order to have them serve as satisfactory guides for the radio signals. For example, small radio-telephone sets mounted in automobiles have been found to have a greater range when transmitting near or under trolley wires which pass near the receiving station than when transmitting from open spaces. Circuits employed for lighting purposes have often been employed as antenna systems for receiving stations but if the transmitter were coupled to the other end of the lighting system the range could not doubt be greatly increased.

It is possible to carry on a number of different conversations simultaneously over a single pair of wires by the wired wireless method without interfering with the phantom circuits of the regular telephone system. By the use of guided radio frequency waves, on a single pair of conductors as many as six conversations have been successfully carried on at once, in addition to the usual multiplex line telephone circuits. In addition to the telephone conversations possible over a single pair of wires a large number of telegraph messages may be sent simultaneously without interfering with one another.

One of the limiting factors affecting the distance over which line telephony may be conducted is the damping out of the alternating current with increasing distance. Attenuation, as it is called, increases with increases in frequency. In ordinary telephony attenuation is responsible for a large amount of distortion in the line so that the listener hears the low notes much louder than the high notes. This is because attenuation affects the higher voice frequencies more than it affects the lower frequencies. In the case of radio frequency, however, the difference in frequency between the various voice frequencies superimposed upon the radio frequency is small compared to the radio frequency itself, and although the total attenuation is greater, the waves are affected about the same so that there is very little distortion.

One of the advantages of wired wireless is the comparative secrecy afforded. As in the case of wire telephony, two circuits on a pole line that carry radio frequencies do not interfere with each other if the wires are properly transposed. The use of different frequencies also helps to reduce the possibilities of interference.

By the use of proper filters radio frequencies but little different may be used for the line radio communication. The filter allows signals of a given frequency only to pass through and may be designed for any desired frequency.

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Lesson No. 165.

AMPLIFICATION AND THE CRYSTAL DETECTOR.

The addition of a vacuum tube amplifier to a receiving circuit employing a crystal detector, will, if properly adjusted, provide a satisfactory means of amplifying the received radio signal. The accompanying diagram shows the method of applying the vacuum tube amplifier circuit to the usual form of crystal receiving set. The primary of the audio-frequency amplifying transformer of standard design replaces the usual connection of the telephone receivers and the secondary of the transformer is connected in the grid circuit of the amplifier tube. The receiving telephones are placed in the plate circuit of the amplifier tube in series with the plate battery. The potential of the plate battery should be variable so as to be adjusted between 22.5 and 45 volts and the positive terminal should be connected to the plate.

When the receiving circuit is properly tuned and the incoming radio waves are impressed upon the detector, the rectifying properties of the crystal cause currents to flow practically in one direction. These currents consist of a series of uni-directional pulsations of high frequency, this frequency being the same as before rectification. The primary of the amplifying transformer superimposed upon the radio frequency current is necessary therefore to provide a by-pass condenser through which the high frequency currents may find a suitable path.

The rectified waves of voltage from the detector after passing through the amplifying transformer are impressed upon the grid of the amplifying tube. The voltage fluctuations of the grid in turn cause comparatively large variations in the plate current and consequently in the current through the receiving telephones thus resulting in considerable magnification of the radio signal.

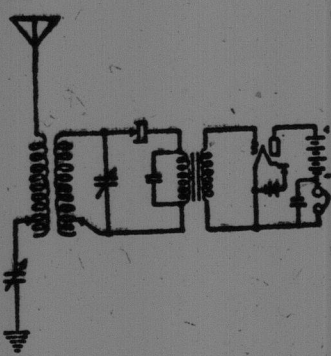
Although the telephone receivers possess a slight value of capacity due to the parallel loads, which act as the two plates of a condenser and to the

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distributed capacity between the turns of the winding, more satisfactory operation is obtained by the use of a condenser of small capacity connected across the receiving telephone.



It should be remembered that contact on a sensitive spot of the crystal is absolutely necessary for satisfactory rectification prior to amplification and therefore provision for maintaining the crystal in adjustment, such as a buzzer test circuit, should be provided. This is particularly necessary in sets employing galena or similar crystals, which utilize for the opposing contact a fine wire resting upon the surface of the crystal with a light pressure and consequently easily thrown out of adjustment. Crystals of more stable in adjustment.

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RECENT WEDDINGS

Richard-London.

The Main street Baptist church parsonage, 222 Main street, was the scene of an interesting event on Wednesday evening, Nov. 22, when Miss Jennie London, daughter of Dr. Harry London, V. B., and Mrs. London, of 171 Chesley street, was united in marriage to Arthur C. Richard, of New London, Conn. The ceremony was performed by Rev. Dr. David Hutchinson, pastor of Main street church. Miss Pearl London was the bridesmaid and Joseph McKenna was the groomsmen. After a short stay in St. John, the bride and bridegroom will return to Mr. Richard's home in the United States.

For-Kitchen.

A wedding of much interest is taking place at St. John this afternoon at the home of the groom's sister, and the bride, Miss Lillian K. Kitchen, accompanied by Mrs. A. G. Turney and Mrs. Harold Limbrick, left by Valley train for St. John and were met at Gagetown by the groom, Wm. P. Fox, who accompanied them to the home of his sister, Mrs. Howard P. Robinson, Chipman Hill, St. John, where the wedding is taking place. The bride, who is the eldest daughter of Hamilton G. Kitchen, of this city, is a graduate of Acadia College, Wolfville, and a well known musician and elocutionist. She has taken a prominent part in amateur theatricals and church affairs, has been the guest of honor at many social functions during the past couple of weeks, and groomed of the popular young ladies of the city. During the ceremony she will wear a tailored suit of brown tulle with a matching, trimmings, name velvet hat to match, and will carry a gold and brocade handbag.

The groom is a native of Gagetown and well known throughout New Brunswick, he being one of the district fruit inspectors for the Federal Department of Agriculture in the Maritime Provinces.

Following the ceremony, Mr. and Mrs. Fox will leave for Boston and other American cities on a two weeks' honeymoon and on their return will take up their residence in this city. Many beautiful wedding gifts were received, including cheques, silver, cut glass, linens and furniture.

The marriage ceremony was performed by Rev. Dr. Poole.

Minard's Lintment For Warts.

RECENT DEATHS

Mrs. Richard McGuire.

The death of Mrs. Mary McGuire, wife of Richard McGuire, and daughter of the late John and Margaret Shannon, occurred at noon yesterday at her home, 114 Chesley street. She is survived by her husband, two sons, Richard and Philip, both of St. John, four daughters, Mrs. W. Phillips, of Randolph, and Mrs. James Connolly, of St. John, Driscoll and Mrs. Harold Duffy, all of this city; and one sister, Miss Catherine Shannon, of West St. John. She was a well known resident

of the North End and many friends will regret to learn of her death.

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We are making a clean-up on a number of styles of Men's Shoes. These include the best Canadian and American makes.

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Mrs. Peter Barrett.

Word was received in the city yesterday of the death of Mrs. Peter Barrett, of Everett, Mass., and came as a shock to many friends. She was a daughter of the late Thomas Griffin of Queens County. She is survived by her husband, five sons and two daughters. Mrs. John Cogger of Haymarket Square, and Mrs. W. O. Mulhally of Norton, are sisters, and Richard Griffin of this city a brother.

Mrs. John Slater.

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Mrs. Peter Barrett.

Mrs. Peter Barrett died at her home in Truro, N. S., Thursday. She was in her seventy-third year and besides her husband is survived by four sons, Richard, Roland, Audrey and William, three daughters, one sister, and two brothers. G. J. Barrett of this city is a son. Her funeral will take place Sunday afternoon in Truro.

Fire Sale STARTS AT Amdur's Tuesday Morning

The Hours: 9 to 11.30 a.m.; 1 to 5 p.m.; 7 to 9.30 p.m.

Every article must be cleared out at once, regardless of the loss, in order to prepare for renovating the premises for the Xmas trade.

Amdur's, Ltd., No. 1 King Square

Shop Now The Children's Shop is Bright With Christmas Displays

Those who have children's names on their gift-lists will do well to look around through our children's shop now. Gifts of the very daintiest kinds are to be found there in great variety—useful things that will be appreciated by parents as well as the little folk. "Wearables" in all sizes from "tots to teens" and gift novelties of many fascinating kinds comprise an unusually interesting selection.

For Babies and Tots These Gifts Are Most Acceptable

Fine Nainsook Dresses, embroidery and lace trimmed. Particularly dainty styles that mothers are bound to admire. Sizes 1 and 2 years. Soft Wool Booties in white or delicate shades of pink or blue. Baby Blankets in velour or eiderdown. Embroidered Silk Puffs in pink or baby blue. Padded Silk Kimonos in pink or blue, with small floral pattern. Ribbon Novelties in Carriage Straps and Hand Decorated Rosettes. Crocheted Jackets in Daintiest Baby Styles. Baby Pillow Cases, embroidered and hemstitched. Baby Toilet Articles, including charming little Brush and Comb Sets. "Binkie" Dolls and Slumber Toys in large variety. Attractive Feeding Bibs trimmed with novelty colored stitching. Pretty Rattles of various sorts.

Gift Wearables For Girls of School Ages

Pretty Night Gowns trimmed with a touch of hand embroidery. All sizes from two to sixteen years. Princess Slips trimmed lace or fine embroidery. Lovely Warm Bath Robes in assorted colors. Pullover and Coat Sweaters in most fashionable styles, colors and stitches. Beautiful Party Frocks in Georgette Crepe, Canton, Crepe de Chine or Taffeta. Styles are as becoming and girlish as you could wish to find. You may choose a model from a variety of the most fashionable shades. Sizes 3 to 14 years. School Dresses in serge or flannel. These are showing in navy, brown or green, trimmed with applique patterns and smart colored stitching. Silk and Satene Underskirts in pretty shades of navy, brown, rose and copen.

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years before he knew how to finish the story. "At page 400 of my manuscript," he says in a chapter of his hitherto unpublished "Autobiography" in Harper's Magazine, "the story made a sudden and determined halt and refused to proceed another step. The reason was very simple—the tank had run dry." After a couple of years he took it up again. "It was then that I made the great discovery that when the tank runs dry you've only to leave it alone and it will fill up again in time, while you are asleep. . . . There was plenty of material now, and the

book went on and finished itself without trouble."

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(The Outlook.) "Tom Sawyer" was not completed all at once. Mark Twain had to stop when he was half way through and wait two

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